

Social LCA Researcher School Book

*Social evaluation
of the life cycle,
application to the
agriculture and
agri-food sectors*

Editor
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09 Deciphering the Pyramids

From CSDH to pyramids (workshop 2)

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To sum up

Among the methods helpful to hierarchize social impacts, we choose to present the one inspired by the Commission on Social Determinants of Health (WHO, 2009). We call it "pyramids". The purpose of using the pyramids is identifying the important social impacts, while classifying them. The cause of impacts is one change, affecting people health at two scales:

- at the nation/region level for one developing country,
- at the rural household level for one developing country.

The principle of the pyramids is that they display ranked "bricks" which are the "social determinants of health". The metric of the pyramids is health of population/health of households. Also, this chapter presents the workshop held about filling in the pyramids, during the researcher school, and highlights the main results in terms of outputs from participants.

Outlook

1. Presentation of the pyramids
2. Workshop 2: using the pyramids

Conclusion

1. Presentation of the pyramids

1.1 Story of LCA from the metric point of view

From the very beginning of societies, it has been useful to assess wealth of people (for example to organize storage of food or collective defense). Tax was collected in the

form of grains, and later in the form of money. So, the spontaneous metric of wealth is exchange money. Along the time, diversification and complexification of societies drive us to assess more and more issues, paying preferential attention to money as metric.

Suddenly and recently, we became aware of the "limits of growth" or, more accurately, of the limited natural resources of our planet. One consequence of this revolution of minds is a general attempt to assess all human activities in terms of impacts on the natural environment. After money, **another metric was born**, the metric of "environmental state".

With social LCA, a third metric is at stake, which accounts for the social realm. In the social LCA research program, we have chosen **the metric of "state of human health"** (relating to public health).



Of course, there is **no equivalence nor compensation** between the first and the second or the third metric.

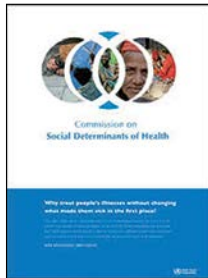
As for the older one, each new metric provides results in several possible units.

- 1) The units of the exchange money are the Egine turtle, seashells, dollar, yen, euro, etc.
- 2) The units of the environmental state (used in ELCA) are "g of CO2 equivalent", "DALY", "PDF x m2x year/kg", "MJ/kg", etc.
- 3) The units of the human health state (used in social LCA) are "days of Life Expectancy", "mortality rate", "morbidity rate" etc.

1.2 Story of the social determinants of health

Between 2005 and 2008, the World Health Organization decided to set up a "Commission of Social determinants of Health" (CSDH), in charge of explaining the relationships between health of population/households and many other factors (e.g. land rights, decent work, bribery etc.). The purpose was to officially acknowledge the **links between relevant social conditions and health**, in order to advise policy makers for sound (inter sectoral) policies for health.





The 19 members of the Commission (including Amartya Sen) are outstanding authority specialists of relationships between social conditions and public health, from the practical and the scientific scopes. The President of the CSDH is Sir Michael Marmot, who devoted his life to the study of relationships between inequalities and health. The results of the CSDH works came out in 2009. The main idea of the CSDH is that:

Social Injustice is killing on a massive scale.

It is noticeable that the members of the CSDH have chosen certain relationships (between social conditions and health) because of **their own experience, even when the relationships are still in debate in the scientific community**.

In the report of the CSDH (WHO, 2009), the authors have split the social determinants into two scales:

- the "macro" scale of one state, or large region, in developing countries (LCD),
- the "meso" scale of a group of rural household, in rural regions of developing countries (LCD).

The diagrams of flows displaying the relationships at the macro-scale (figure 1) and at the meso-scale (figure 2) are depicted hereafter.

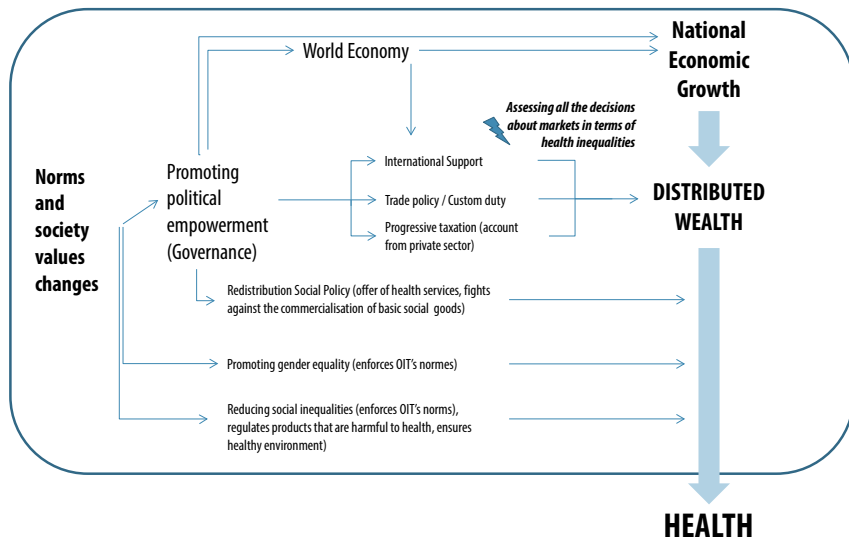


Figure 1: Diagram of flows at macro-scale

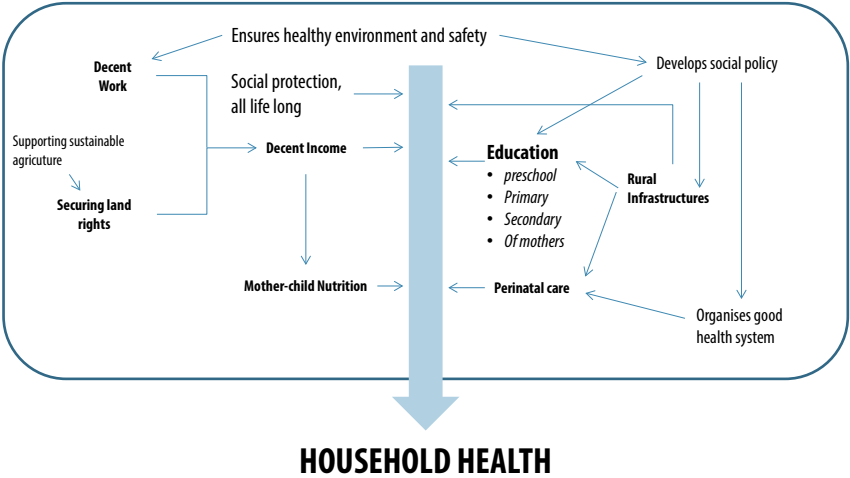


Figure 2: Diagram of flows at meso-scale

The pyramids are none the less than **another representation** of the relevant relationships between social conditions and health, as supported by the CSDH. The figures 3 & 4 illustrate how we have translated one part of the diagram of flows into one elementary pyramid, from the macro-scale diagram of flows.

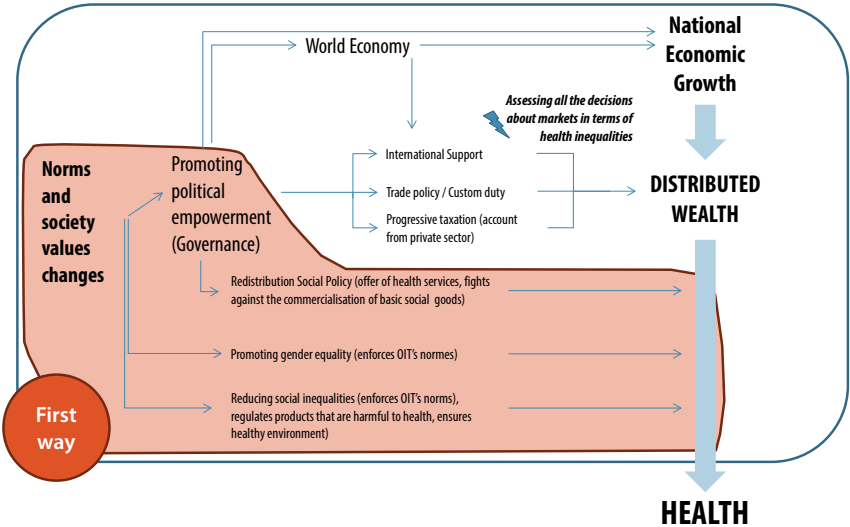


Figure 3: In orange, we highlight one part of the flows diagram . . .

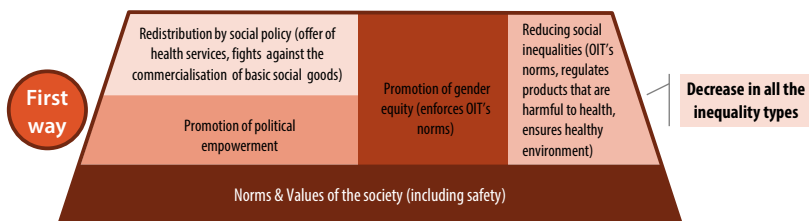


Figure 4 : ... which is translated under the shape of several bricks, forming all together a pyramid

1.3 Presentation of the resulting pyramids

At the macro scale, we present the three elementary pyramids in one specific order, despite there is no hierarchy among them. The specific order accounts for history. Indeed, we remark that:

- at the Neolithic age (growth is nearly zero for long time and international trade is low) only the bottom pyramid exists;
- in a more recent society, when there is not real economic growth yet, only the bottom and the middle pyramids exist;
- when there is significant economic growth, the three pyramids are relevant.

Here below (figure 5) is the resulting representation of the 3 elementary pyramids at macro-scale. All together, they shape a new bigger pyramid.

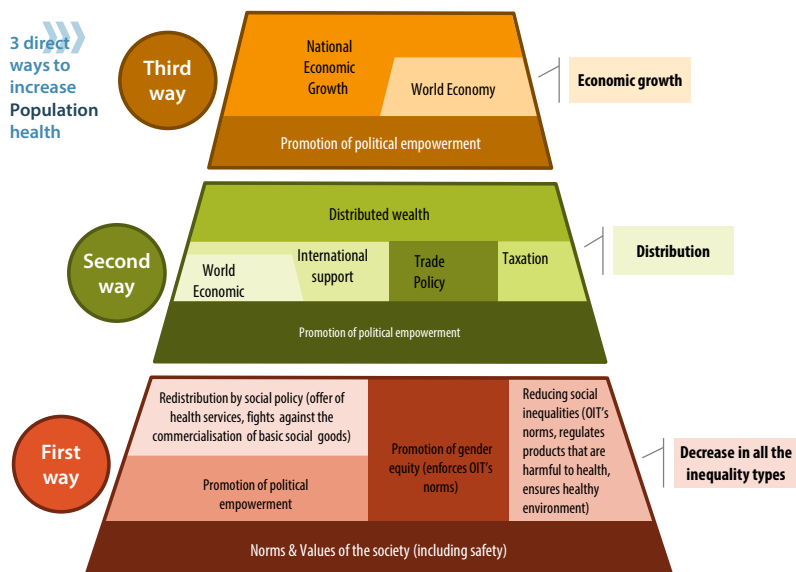


Figure 5: Pyramid of the social determinants of health in LCD, at the nation-scale

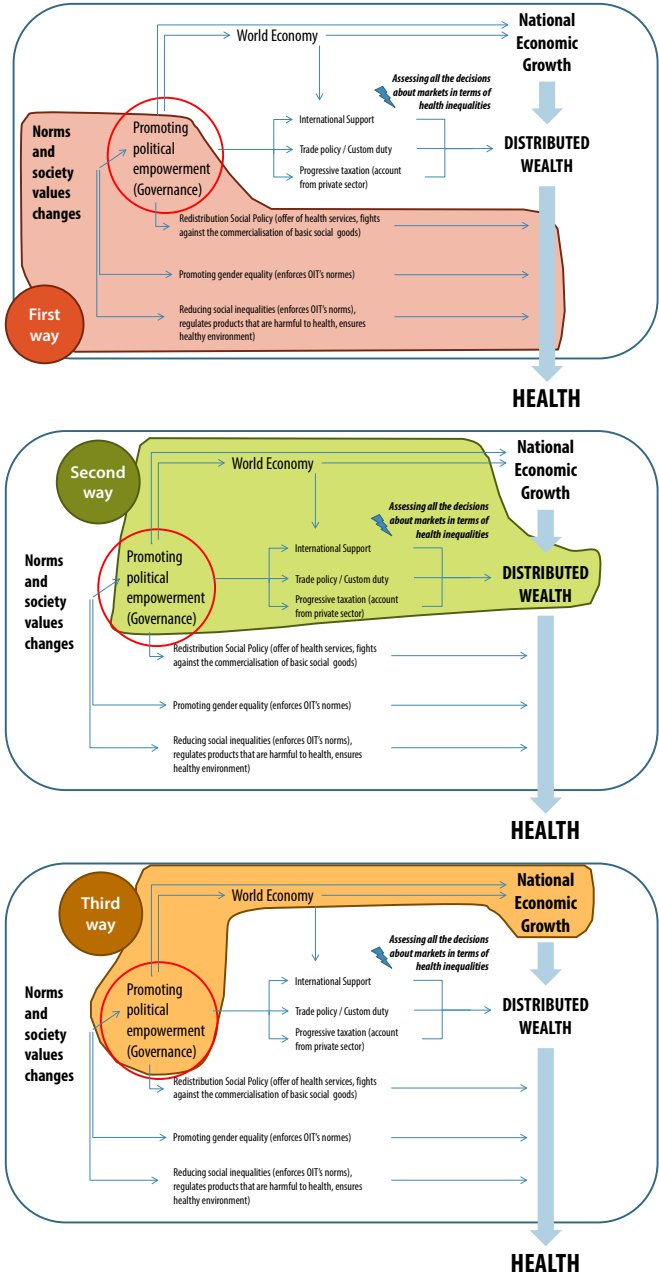


Figure 6: "Promoting political empowerment" is a crossroad of the three paths to improve population health

The figure 5 highlights that "promotion of political empowerment" is one brick belonging to the three elementary pyramids, while this brick does not occupy the same position in the three elementary pyramids. Indeed, as underlying by the figure 6, the "promotion of political empowerment" is a cross road for the different paths towards population health.

At the meso-scale (rural households), we designed two paths towards households health, as displayed in the figure 7. There is no hierarchic order among the two pathways, so the resulting pyramid is made of two equivalent parts, set side by side (figure 8).

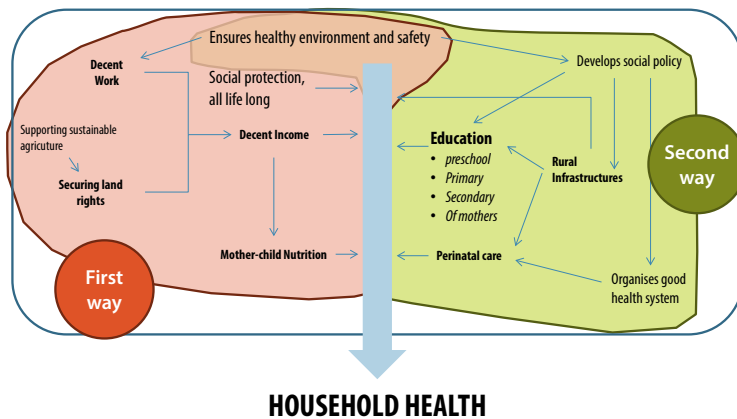


Figure 7: The two paths towards rural household health

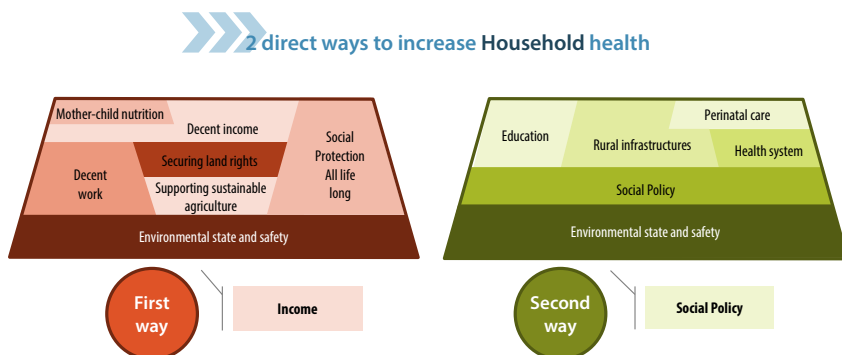


Figure 8: Pyramid of the social determinants of rural household health, in LCD country

It is noticeable that "Ensuring healthy environment and safety" is the root for both pathways towards rural household health. The pyramid shapes highlight the hierarchy among the different brick of each elementary pyramid. For instance, **setting a fair social policy** is more important than **setting fair health system** alone. If necessary (for instance to perform scoring) it is possible to allocate one given weight to each brick of the pyramids.

1.4 Weighting the pyramids

First, we are describing the rules to get "weighting of the pyramids" (§ 1.4.1), then we are presenting possible results for the macro-scale (§ 1.4.2) and for the meso-scale (§ 1.4.3).

1.4.1 Rules to "weight the pyramids"

We decided to set **some rules** in order to weight the bricks inside the pyramids. We have arbitrarily decided to allocate the same number of points to each elementary pyramid. Indeed, each elementary pyramid describes a path towards health, and we do not know the hierarchy (if any) among the elementary pyramids.

- The total number of points by elementary pyramid is arbitrarily set to 10.
- The more a brick is down in the pyramid, the more its own weight is high. Indeed, we consider that the lowest bricks are the basic, the fundamental ones. Any action upon one basic brick is prone to cause larger social impacts than the impacts caused by the equivalent action upon one higher brick. To account for this preponderance allocated to basic bricks,

X+1 being the level immediately superior to X

X-1 being the level immediately inferior to X

The total number of points at one level X of the pyramid is k, with:
"total of the points at the level X+1 < k < total of the points at the level X-1"

- The weight of one brick alone increases in proportion with the number of relationships the brick is involved in. The number of relationships is indicated by the height of the brick (the number of levels covered by the brick).

Following these rules, we can suggest weights for each brick. Examples are provided in the next two paragraphs.

1.4.2 Suggestion of weights for the pyramid at macro-scale

In order to weight each brick, we start from 10 points to be split into all the bricks of the elementary pyramid. First, we determine the number of levels in the elementary pyramid. Here, the bottom pyramid handles three levels, the middle one handles four levels, and the upper one three levels.

Then, for the elementary pyramid at the bottom (for instance) we divide 10 points between three levels, taking care that the number of point by level is decreasing as we are climbing the levels. We decided to keep whole numbers (as far as possible), and so we distribute the 10 points as follows:

- **5 points** (among 10) at the lowest level,
- **3 points** (among 10) at the following upper level,
- **2 points** (among 10) at the following upper level again.

Then, the **5 points** allocated at the lowest level are the weight of the brick "Norms and values of the society".

The **3 points** must be divided into the 3 bricks: "Promotion of political empowerment" (1 point), the bottom of the brick "Promotion of gender equity" (1 point) and the bottom of the brick "Reducing social inequalities" (1 point).

The **2 points** must be divided into the 3 bricks: "Redistribution by social policy" (2/3 point), the top of the brick "Promotion of gender equity" (2/3 point) and the top of the brick "Reducing social inequalities" (2/3 point).

By adding the points gained at the bottom and at the top of each brick, we get the figure 9, and so on for the other elementary pyramids.

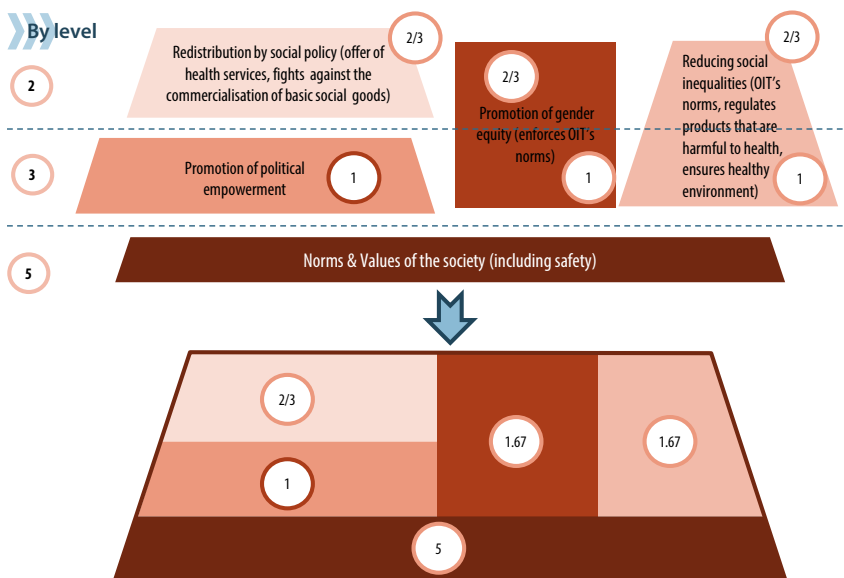
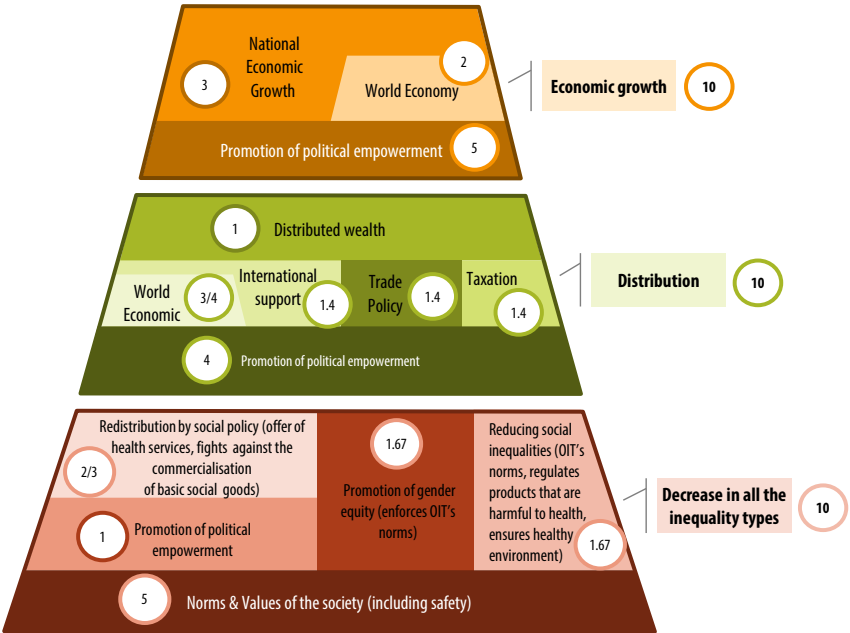


Figure 9: Example explaining the weighting process for one elementary pyramid

For the macro-scale, the resulting full picture is displayed in figure 10.



1.4.3 Suggestion of weights for the pyramid at meso-scale

With the same rules and hypotheses, we can suggest the weighting of bricks at the meso-scale (rural households), as displayed in the figure 11.

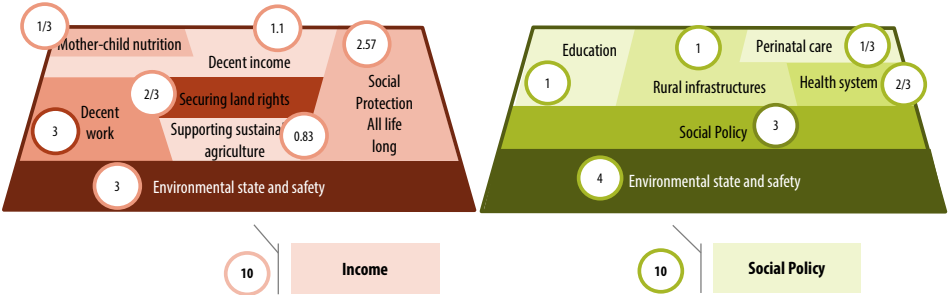


Figure 11: Example of weighting at the meso-scale

Of course, other systems to weight the bricks of the pyramids are possible and welcome. The ones presented above are the simplest to represent the hierarchic order among bricks translated from the Commission of Social Determinants of Health's work.

1.5 Filling in the pyramids

The pyramids can be useful for research or for implementing case study.

1.5.1 Setting a diagnostic about one given situation

The first usage is **setting a diagnostic about a given value chain** (example in the figure 12), in general for gate-to-gate parts of the whole life-cycle. In this case, **the reference state is the situation where the value chain would not exist**. For instance, the data may be collected within sustainability reports of the central company driving the value chain. The work to be done is searching for **information about the present state**, for all the topics of interest in the pyramids.

The outputs highlight the bricks for which no information has been found, and the bricks displaying many different actions. When the brick is empty, it is important to sort out the cases where there is nothing (no action), from the cases where we simply do not know it.

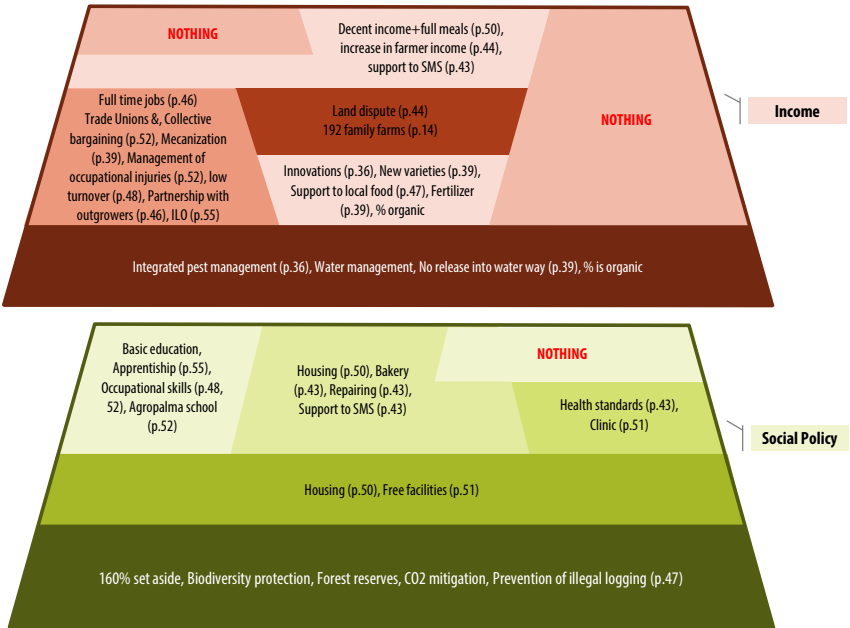


Figure 12: An example of diagnostic by meso-scale pyramid, filled in from sustainability report

We can compare different diagnostics, and we may score the bricks (cf. § 1.4). Nevertheless, for comparing diagnostics of two different value chains (of the same product), even if we fill in the same bricks and if they are ranked in the same order, we must be aware that **we likely do not use the same features** of the situation (for instance, to fill in the brick "rural infrastructure" in one case we focus on "roads maintenance", while we focus on "sewage" in the second case). So comparison of pyramids between different sites remains at risk of misunderstanding.

1.5.2 Assessing one project/one change

The second usage is **assessing a project** which affects (or will affect) the value chain, regarding at least one part of the life-cycle. The change can be assessed by anticipation, or after the change occurs. The reference state is either the situation before the project/change to occur, or another state of the situation (for instance an alternative project which might be implemented instead). The work to be done is searching for **information about changes** for all the topics of interest in the pyramids. In this case too, about empty brick, we must sort out the cases where there is (will be) no change, from the cases where we do not get knowledge about it.

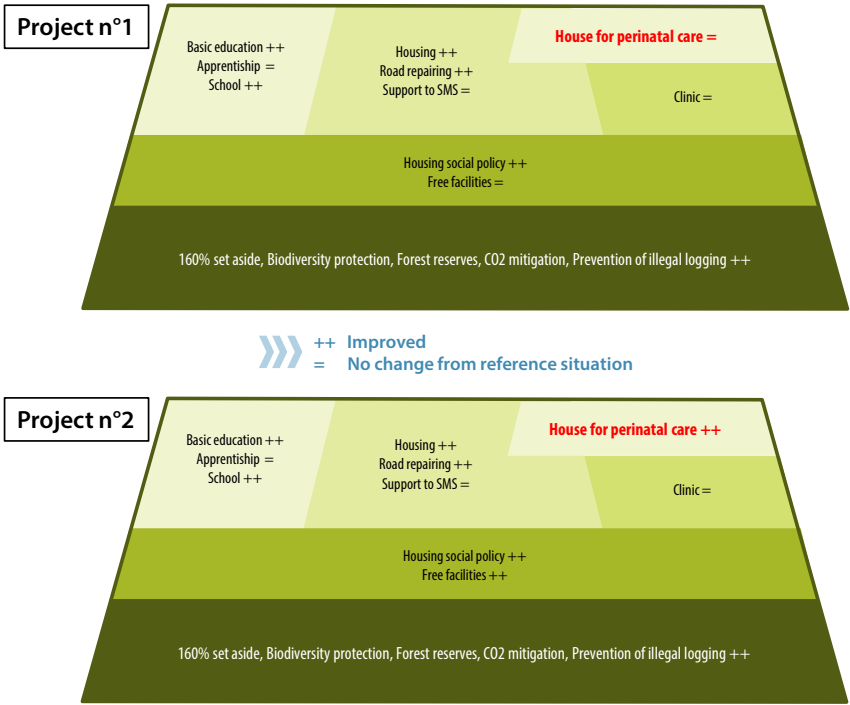


Figure 13: Two elementary pyramids filled with the same features, for two projects affecting the same value chain

Moreover, we can compare different projects, and we may score the bricks (cf. § 1.4). Nevertheless, for comparing projects regarding the same value chain, we must fill in the same bricks and ranked in the same order, and we must **use the same features** of the situation. If these conditions are fulfilled, the comparisons are meaningful and may be relevant for policy-making (whatever scoring or not). The figure 13 presents a comparison between two projects regarding the same value chain.

2. Workshop 2: using the pyramids

This second section describes the workshop 2.

2.1 Differences between the workshop and real-life practice

When starting the workshop, we addressed differences between one real case-study, and what we can achieve during the workshop.

In real-life practice, the team in charge:

- sets the project;
- collects general information about the context (e.g. country features, laws, history of the case, evolution, social stakes etc.);
- seeks to find specific information about the project, as far as possible;
- organizes and picks up interviews from relevant actors;
- by iterations with the pyramids, the team tries to fill in the pyramids' bricks with all the relevant information collected.

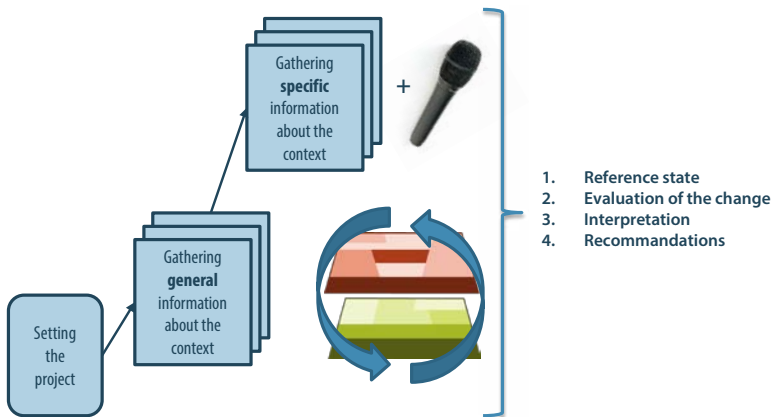


Figure 14: Steps when implementing a real case-study

The objectives are to know and to describe the reference state, to evaluate the change, to interpret the impacts of the change, and to provide recommendations. The figure 14 schematizes the real-life practices.

In workshop practice, the team in charge makes something different.

It is not possible to address all the real-life practices during the workshop time frame. We describe the part of the real case-study we can perform during the researcher school, in the figure 15.

In order to implement the workshop, the facilitators of the researcher school provide:

- the design of the project;
- two documents gathering general information about the context;
- the "Agropalma Sustainability Report 2013", to cope with specific information;
- the results of supposed interviews of actors.

The tasks devoted to the participants are:

- i) setting the reference state,
- ii) evaluating the impacts of the planned change,
- iii) providing interpretation and recommendations.

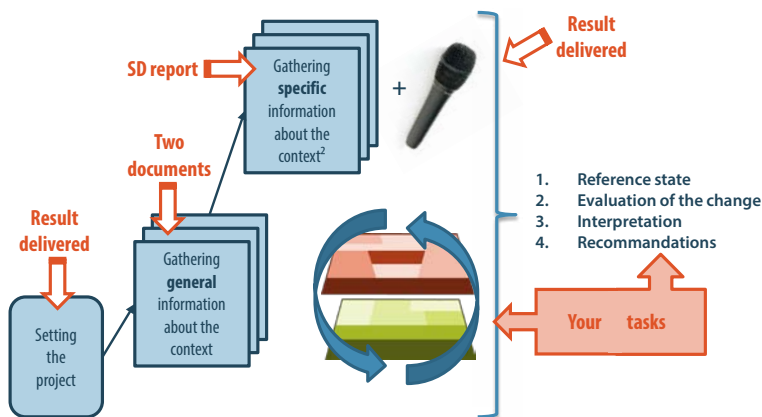


Figure 15: Part of the case-study practice we can deal with at the researcher school

2.2 Presentation of the case study

The project under scrutiny is that a large company producing palm oil in Brazil is willing to increase the surface of cultivation of palm, which will be cultivated in the same conditions as the current ones. Nevertheless, new varieties of palm will be devoted to internal usage only, and not to exportations. The documents about the context are the "Palm oil" chapter from the Yearbook 2015 Cyclope (2016), For whom tolls

the bell? (Cyclope 2016), and the published paper: Drouvot C. M., Drouvot H. Perluss P. (2014) Greenhouse Gas Reduction through Social inclusion in Brazil, International Journal of Sustainable Development, Volume 17, Issue 1. The specific document is the Agropalma Sustainability Report 2013.

The results of the supposed interviews are: "There is less inhabitants and services in the new area, and rights of native peoples might be threatened. The new plantation takes the risk of attracting migrant workers from neighbour regions."

Warning! The situation has been imagined and does not reflect any project from the Agropalma Company itself. Of course, the aim of the workshop is not criticizing a real project, but about performing together an exercise using the pyramids.

Here (figure 16) are the pyramids at the meso-scale, filling in by the facilitators of the workshop, and from the same documents as the participants' ones.

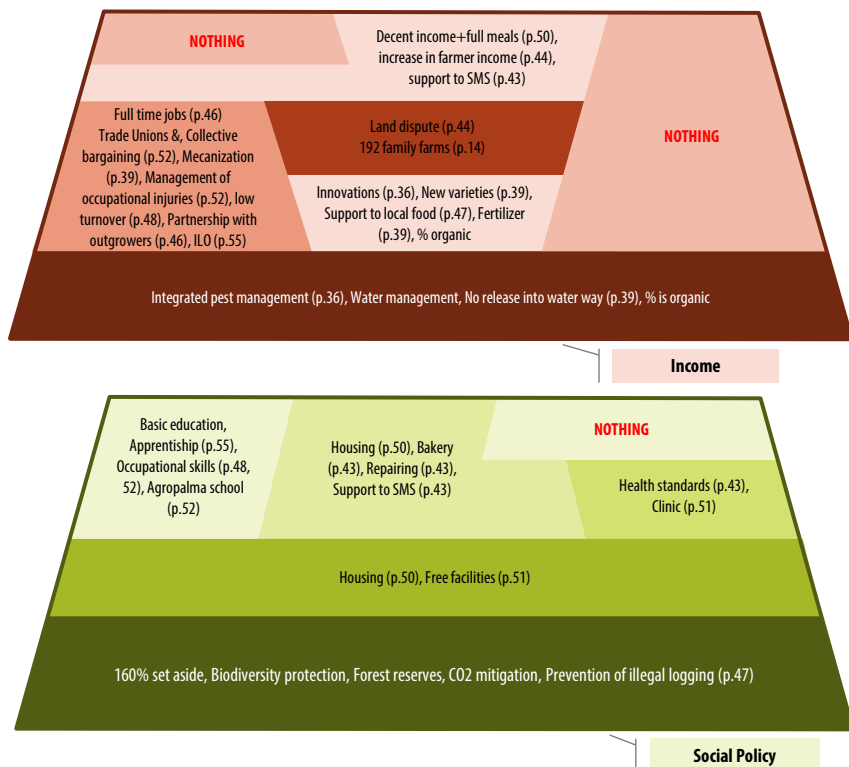


Figure 16: Reference state used in the workshop
(the numbers are the pages of the Sustainability report devoted to the corresponding topic)

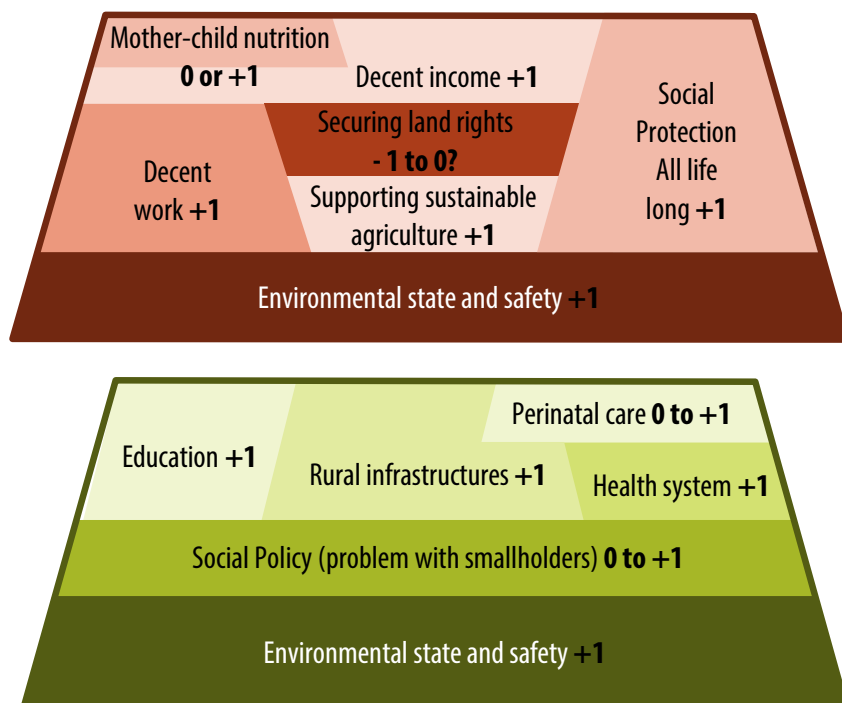


Figure 17: Possible scoring of the change in the workshop

The figure 16 represents the reference state, while the figure 17 displays the scoring of the change.

As it is obvious from this picture, in some cases, it is difficult to choose between 0 and 1, or -1 and 0. It means that interpretation is difficult because of lack of knowledge, or because of contradictory insights.

2.3 Practical organization of the workshop

The participants were divided into four groups, located in different places. Each group received the same instructions about time and tasks (see figure 18).

A calculator (excel sheet, see figure 19) was available for the participants, to get immediate results from the scoring of bricks, and to help performing several simulations.

Workshop 2: time organisation

- 1) First slot: 1h30**
 - Task: understanding and using the documents
 - Expected results: filled pyramids with
 - the reference state
 - the scores of the project in the different bricks
- 2) Second slot: 15 mn (with the calculator)**
 - Scoring the pyramids
 - Discussing
 - Interpretation
- 3) Third slot: 10 mn each group**

Restitution:

 - Reference state
 - Scoring of the change
 - Interpretation
 - Recommendations

Figure 18: Time organization during the workshop

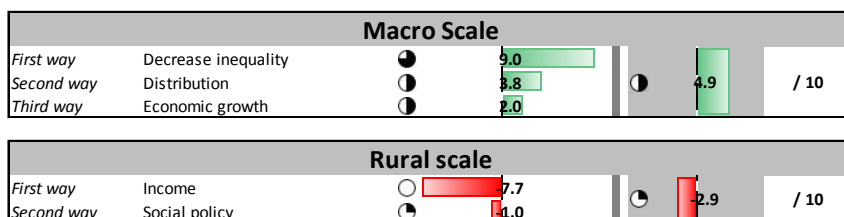


Figure 19: Scoring calculator for the pyramids

2.4 Outputs from the workshop

In terms of time

Many discussions were held within each group. So, not all the groups achieved the work of scoring the change. One group performed the assessment of the reference state only. In general, time devoted to the exercise was not enough.

In terms of filling in the pyramid

All the groups used the bricks of the pyramid to put rough information (mainly taken from the sustainability report) and to gather it in a meaningful way. The different groups found the same information and allocated it to the same brick.

In terms of interpretation

Nevertheless, the interpretation of the information was diverse, depending on the group, and depending on how they have deepened the topic. Some group decided not to take for granted the data provided by the sustainability report, and to fine-tune their interpretation thanks to other opinions (often contrary to the report views). One group deemed that the sustainability report was not detailed enough.

In terms of scoring

When the groups performed scoring, it was different from one group to another, because of the different interpretations attributed to the same information.

Conclusion

The pyramids are ways of implementing the new social metric, which is "human health" of the general population, and of the rural households. They only reflect the works of the Commission on Social Determinants of Health. This commission has been set up by the World Health Organization to propose new approach of public health by social determinants, rather than by the sanitary ones. When filled in from case studies, the pyramids gather information either about the diagnostic of one life-cycle (then, comparisons between cases are delicate), or about the analysis of changes. This latter case, when comparing projects regarding the same value chain, is relevant. As displayed in this chapter, it is possible to weight the different bricks. Nevertheless, when the information reported in one given brick alone is contradictory, the comparison of situations is very delicate.

The exercise highlights the issue of completion of information. During the workshop, few documents are provided (because of time frame). In real-life practice, it is mandatory to gather as many documents and sources as possible, and to cross many sources of information. Doing so, the team can achieve the "completion" of the case (it means that any new source of information would not provide new insights). When completion and crossing of data are achieved, the disparity of interpretations decreases, even if there is always room for the subjectivity of researchers.

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